

WHAT IS CLAIMED IS:

1. A hot melt adhesive composition, comprising:

- a) a semi-crystalline, thermoplastic, hot melt adhesive polymer; and
- b) a clay component incorporated into the adhesive polymer, said clay component comprising an organophilic clay.

2. The hot melt adhesive composition of claim 1, wherein the organophilic clay is at least partially exfoliated.

3. The hot melt adhesive composition of claim 1, wherein the percent transmission of the hot melt adhesive composition in the visible region of the spectrum is at least 80% of the percent transmission of an identical adhesive composition containing no organophilic clay.

4. The hot melt adhesive composition of claim 1, further comprising at least one curable material selected from a monomer, an oligomer, a polymer, and combinations thereof.

5. The hot melt adhesive composition of claim 1, wherein the adhesive polymer has a weight average molecular weight in the range of 1000 to 1,000,000.

6. The hot melt adhesive composition of claim 1, wherein the adhesive polymer is hydrophobic.

7. The hot melt adhesive composition of claim 1, wherein the adhesive polymer is a block copolymer and comprises a hydrophobic block.

8. The hot melt adhesive composition of claim 1, wherein the adhesive polymer comprises at least one polyether chain segment and at least one polyamide chain segment.

9. The hot melt adhesive composition of claim 1, further comprising a tackifier.

10. The hot melt adhesive composition of claim 1, wherein the clay component comprises an organophilic smectite clay.

5 11. The hot melt adhesive composition of claim 1, wherein the composition comprises from about 1 to about 25 weight percent of the organophilic clay based upon the total weight of the composition.

12. An electrically conductive adhesive composition comprising:

- 10 a) a polymeric adhesive component;  
b) an electrically conductive filler incorporated into the adhesive component; and  
c) a clay component incorporated into the adhesive component, said clay component comprising an organophilic clay.

15 13. The electrically conductive adhesive composition of claim 12, wherein the adhesive component comprises a semi-crystalline, thermoplastic polymer.

20 14. The electrically conductive adhesive composition of claim 12, wherein the electrically conductive filler comprises a plurality of electrically conductive particles.

15. The electrically conductive adhesive composition of claim 12, wherein the electrically conductive filler comprises an electrically conductive scrim.

25 16. The electrically conductive adhesive composition of claim 12, wherein the composition comprises 1 to 80 volume percent of the filler based upon the total volume of the composition.

30 17. The electrically conductive adhesive composition of claim 12, wherein the adhesive component further comprises at least one curable material selected from a monomer, an oligomer, a polymer, and combinations thereof.

18. The electrically conductive adhesive composition of claim 11, wherein the thermoplastic polymer has a weight average molecular weight in the range of 1000 to 1,000,000.

5 19. The electrically conductive adhesive composition of claim 16, wherein the thermoplastic polymer is hydrophobic.

20. The electrically conductive adhesive composition of claim 12, wherein the thermoplastic polymer is a block copolymer and comprises a hydrophobic block.

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21. The electrically conductive adhesive composition of claim 12, wherein the thermoplastic polymer comprises at least one polyether chain segment and at least one polyamide chain segment.

15 22. The electrically conductive adhesive composition of claim 12, further comprising a tackifier.

23. The electrically conductive adhesive composition of claim 12, wherein the clay component comprises an organophilic smectite clay.

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24. The electrically conductive adhesive composition of claim 12, wherein the composition comprises from about 1 to about 25 weight percent of the organophilic clay based upon the total weight of the composition.

25 25. A method of providing an electrical connection between first and second electrical conductors, comprising the step of electrically coupling an electrical component on a first structure to an electrical component on a second structure using an adhesive composition, said adhesive composition comprising:

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- a) a polymeric adhesive component;
  - b) an electrically conductive filler incorporated into the adhesive component; and
  - c) a clay component incorporated into the adhesive component, said clay component comprising an organophilic clay.

26. A method of making an electrically conductive adhesive composition, comprising the steps of:

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- a) incorporating an organophilic clay into an adhesive composition; and
  - b) after incorporating the clay into the adhesive composition, incorporating an electrically conductive filler into the adhesive composition.

10 27. The method of claim 26, wherein the organophilic clay is at least partially exfoliated.

15 28. The method of claim 26, wherein the adhesive composition is derived from a plurality of ingredients in addition to the clay, and said method further comprising the step of causing the clay to be exfoliated by first combining the clay with one or more of the ingredients with which the clay is more compatible relative to the other ingredients of the composition.

20 29. The method of claim 26, wherein steps (a) and (b) are carried out with substantially no solvent.

25 30. The method of claim 26, wherein the step of incorporating the organophilic clay into the adhesive composition comprises combining the clay with at least one component of the adhesive composition in an extruder .

30 31. An electronic assembly, comprising:  
a first structure comprising a first electrical component;  
a second structure comprising a second electrical component; and  
an electrically conductive adhesive composition electrically interconnecting said first and second electrical components, said composition comprising:  
a) a polymeric adhesive component;  
b) a plurality of electrically conductive particles incorporated into the adhesive component; and

- c) a clay component derived from ingredients comprising an organophilic clay, said clay component being incorporated into the adhesive component.

5 32. The electronic assembly of claim 31 wherein the electrically conductive adhesive composition is an anisotropically electrically conductive adhesive composition.

10 33. A method of making an electrically conductive adhesive composition, comprising the step of incorporating an organophilic clay into a composition comprising an adhesive polymer and an electrically conductive material.

15 34. An electrically conductive adhesive tape, comprising:  
a backing; and  
an adhesive composition provided on the backing, said adhesive comprising electrically conductive material and an organophilic clay.

20 35. An anisotropically, electrically conductive adhesive composition, comprising:  
a) a polymeric adhesive component;  
b) a plurality of electrically conductive particles incorporated into the adhesive component; and  
c) a clay component incorporated into the adhesive component, said clay component comprising an organophilic clay.